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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,446	09/30/2003	Kent A. Burr	06005/38033	5635
4743	7590	10/19/2005	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP 233 S. WACKER DRIVE, SUITE 6300 SEARS TOWER CHICAGO, IL 60606			ROMAN, LUIS ENRIQUE	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/675,446

Applicant(s)

BURR ET AL.

Examiner

Luis Roman

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 16-23, 28-32 and 35-37 is/are rejected.
- 7) ☒ Claim(s) 12-15 24-27, 33 and 34 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/12/04, 02/18/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 31, 32 & 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Eryurek (US 6370448).

Regarding claim 1 Eryurek discloses a communication bus suitable for use in a hazardous area of a process plant (col. 3 lines 1-6 & Fig. 1 element 36), the communication bus comprising: a first transmission path adapted to communicate electrical signals in a first direction (col. 7 lines 1-3 “sending” & Fig. 2 element 36); a second transmission path adapted to communicate electrical signals in a second direction (col. 7 lines 1-3 “receiving” & Fig. 2 element 36); and a safety device coupled to each of the first and second transmission paths (Fig. 1 element 32), wherein the safety device includes a control unit (Fig. 2 element 66) adapted to detect a fault condition associated with the communication bus (col. 4 line 67, col. 5 line 1 & Fig. 2 element 65), and wherein the safety device further includes a switch unit adapted to interrupt the flow of electrical signals along each of the first and second transmission paths in response to the detected fault condition (col. 5 lines 1-4 & Fig. 2 element 70; any software or hardware that is “able to produce a given result” has inherently switches).

Regarding claim 2 Eryurek discloses the communication bus of claim 1. Eryurek further discloses wherein the detected fault condition associated with the communication bus includes at least one of an open circuit, an electrical discontinuity, a cut in the communication bus, a severed communication bus, and a disconnected end of the communication bus (col. 7 lines 39-41 & Fig. 4 element 76).

Regarding claim Eryurek discloses the communication bus of claim 1. Eryurek further discloses including a third transmission path (Fig. 1 elements: 36 from - 32left - 32right) and a fourth transmission path (Fig. 1 elements: 36 from - 32right - 32left), wherein the safety device (Fig. 1 elements 32) is coupled to each of the third and fourth transmission paths.

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Regarding claim 4 Eryurek discloses the communication bus of claim 3. Eryurek further discloses wherein each of the first, second, third, and fourth transmission paths includes twisted pair cable or coaxial cable (col. 3 lines 59-62).

Regarding claim 5 Eryurek discloses the communication bus of claim 3. Eryurek further discloses wherein the control unit includes a first control device (Fig. 1 element 32right) coupled to the third transmission path (Fig. 1 elements: 36 from - 32left - 32right) and a second control device (Fig. 1 element 32left) coupled to the fourth transmission path (Fig. 1 elements: 36 from - 32right - 32left), wherein the first control device includes a first signal source adapted to generate an electrical signal that is communicated in the first direction along the third transmission path (col. 4 lines 64-67 & col. 5 line 1, for element 32right in Fig. 1) and wherein the second control device includes a second signal source adapted to generate an electrical signal that is communicated in the second direction along the fourth transmission path (col. 4 lines 64-67 & col. 5 line 1, for element 32left in Fig. 1).

Regarding claim 6 Eryurek discloses the communication bus of claim 5. Eryurek further discloses wherein the first control device includes a first sensor (col. 3 lines 27-32, col. 4 line 67-col. 5 line 1 & Fig. 3 element 64) adapted to measure an electrical characteristic associated with the third transmission path (Fig. 1 elements: 36 from - 32left - 32right), and wherein the second control device includes a second sensor (col. 3 lines 27-32, col. 4 line 67-col. 5 line 1 & Fig. 3 element 64) adapted to measure an electrical characteristic associated with the fourth transmission path (Fig. 1 elements: 36 from - 32right - 32left).

Regarding claim 7 Eryurek discloses the communication bus of claim 6. Eryurek further discloses wherein the measured electrical characteristic associated with each of the third and fourth transmission paths includes current (col. 3 lines 37-39), voltage, or resistance.

Regarding claim 8 Eryurek discloses the communication bus of claim 6. Eryurek further discloses wherein the first control (Fig. 1 element 32right) device includes a first comparator (col. 6 lines 1-9 & Fig. 2 element 66; this "processor circuit" inherently has a comparator to make decisions between info stored in "memory" element 62 and data received from the "sensor" element 65) adapted to compare the measured electrical characteristic associated with the third transmission path to a normal operational value (Fig. 1 elements: 36 from - 32left - 32right), and wherein the second control device (Fig. 1 element 32left) includes a second comparator (col. 6 lines 1-9 & Fig. 2 element 66; same reason than for the first comparator above) adapted to compare the measured electrical characteristic associated with the fourth transmission path to the normal operational value (Fig. 1 elements: 36 from - 32right - 32left).

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Regarding claim 9 Eryurek discloses the communication bus of claim 8. Eryurek further discloses wherein the switch unit includes a first switch (col. 5 lines 1-4 & Fig. 2 element 70) coupled to the first control device (Fig. 1 element 32right) and a second switch (col. 5 lines 1-4 & Fig. 2 element 70) coupled to the second control device (Fig. 1 element 32left).

Regarding claim 10 Eryurek discloses the communication bus of claim 9. Eryurek further discloses wherein at least one of the first switch (Fig. 3 element 70), the second switch, the first control device (Fig. 3 element 66, in first control device 32left of Fig. 1), and the second control device is housed (col. 6 lines 11-21) in a protective enclosure.

Regarding claim 31 Eryurek discloses a method (a person of the ordinary skill will understand a method that is intrinsically described by the functioning of the apparatus) for providing a communication bus suitable for use in a hazardous area of a process plant (Fig.1 element 36), the method comprising: communicating electrical signals (col. 3 lines 59-62) along a first transmission path (Fig. 1 element 36 from 34 to 32left); communicating electrical signals along a second transmission path (Fig. 1 element 36 from 32left to 34); measuring an electrical characteristic associated with the second transmission path (col. 9 lines 24-29); detecting a fault condition associated with the communication bus in response to the measured electrical characteristic associated with the second transmission path; and interrupting the flow of electrical signals along the first transmission path in response to the detected fault condition associated with the communication bus (claim 19).

Regarding claim 32 Eryurek discloses the method of claim 31. Christensen et al. further discloses wherein detecting the fault condition associated with the communication bus includes detecting at least one of an open circuit, an electrical discontinuity, a cut in the communication bus, a severed communication bus, and a disconnected end of the communication bus (col. 7 lines 26-44).

Regarding claim 35 Eryurek discloses the method of claim 31. Christensen et al. further discloses wherein measuring the electrical characteristic associated with the second transmission path includes measuring current, voltage, or resistance (col. 4 lines 53-64 & Fig. 3 element 52).

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 16, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30, 36 & 37 are rejected under 35 U.S.C. §103(a) as being unpatentable over Eryurek (US 6370448) in view of Christensen et al. (US 6912671).

Regarding claim 11 Eryurek discloses the communication bus of claim 9. Eryurek does not disclose wherein the first switch includes a first relay and a second relay, and the second switch includes a third relay and a fourth relay, wherein each of the first and second relays is coupled to the first control device, and wherein each of the third and fourth relays is coupled to the second control device.

Christensen et al. teaches wherein the first switch (Fig. 3 element 150) includes a first relay and a second relay (col. 10 lines 8-14), and the second switch (Fig. 3 element 150) includes a third relay and a fourth relay (col. 10 lines 8-14), wherein each of the first and second relays is coupled to the first control device (relays from Fig. 3 element 150 connected to smart field devices Fig. 1 elements 22 through 26, 28, 30), and wherein each of the third and fourth relays is coupled to the second control device (same as for first control device, note that in Eryurek device the control devices (32left & 32right) included the switch (Fig. 2 element 70)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Eryurek device with the Christensen et al. device features, since relays are devices used to connect/disconnect control devices and which provide high reliability. Both devices are in the same problem solving area of fieldbus communication for industrial processes.

Regarding claim 16 Eryurek discloses a safety device adapted for use in a hazardous area of a process plant, the safety device comprising: a communication bus including a first transmission line (Fig.1 element 36 from 34 to 32left) and a second transmission line (Fig.1 element 36 from 34 to 32left), wherein both the first and second transmission lines are adapted to communicate electrical signals (col. 3 lines 59-62); a control unit coupled to the second transmission line (Fig. 1 element 32left).

Eryurek does not disclose that the control unit coupled to the second transmission line is adapted to detect a fault condition associated with the communication bus; and a switch unit coupled to the first transmission line and

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the control unit, wherein the switch unit is adapted to interrupt the flow of electrical signals along the first transmission line in response to the detected fault condition associated with the communication bus.

Christensen et al. teaches that the control unit coupled to the second transmission line is adapted to detect a fault condition associated with the communication bus (col. 9 lines 24-29); and a switch unit coupled to the first transmission line and the control unit, wherein the switch unit is adapted to interrupt the flow of electrical signals along the first transmission line in response to the detected fault condition associated with the communication bus (claim 19). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Eryurek device with the Christensen et al. device features, since in hazardous environments like pipes carrying explosive gases or liquids require to detect failures in the fieldbus and react as quickly as possible to avoid any possible fire or explosion.

Regarding claim 17 Eryurek in view of Christensen et al. discloses the safety device of claim 16.

Christensen et al. further discloses wherein the control unit includes a sensor (col. 4 lines 53-64) adapted to measure an electrical characteristic associated with the second transmission line (Fig. 2 elements 128, 30).

Regarding claim 18 Eryurek in view of Christensen et al. discloses the safety device of claim 17.

Christensen et al. further discloses wherein the measured electrical characteristic associated with the second transmission line includes current, voltage, or resistance (col. 4 lines 53-64 & Fig. 3 elements 152, 158, 160, 168).

Regarding claim 19 Eryurek in view of Christensen et al. discloses the safety device of claim 17.

Christensen et al. further discloses wherein the control unit includes a comparator (col. 13 lines 6-19 & Fig. 4A element 210) adapted to compare the measured electrical characteristic associated with the second transmission line to a normal operational value.

Regarding claim 20 Eryurek in view of Christensen et al. discloses the safety device of claim 19.

Eryurek further discloses wherein the first transmission line includes a first transmission signal path adapted to communicate electrical signals in a first direction (col. 7 lines 1-3 "sending" & Fig. 2 element 36), and a second transmission signal path adapted to communicate electrical signals in a second direction (col. 7 lines 1-3 "receiving" & Fig. 2 element 36).

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Regarding claim 21 Eryurek in view of Christensen et al. discloses the safety device of claim 20.

Eryurek further discloses wherein the second transmission line includes a third transmission signal path (Fig. 1 elements: 36 from - 32left - 32right) adapted to communicate electrical signals in the first direction (col. 8 lines 60-65 sending or receiving), and a fourth transmission signal path (Fig. 1 elements: 36 from - 32right - 32left) adapted to communicate electrical signals in the second direction (col. 8 lines 60-65 sending or receiving).

Regarding claim 22 Eryurek in view of Christensen et al. discloses the safety device of claim 21.

Christensen et al. further discloses wherein each of the first, second, third, and fourth transmission signal paths includes one wire or two wires (col. 5 lines 36-43).

Regarding claim 23 Eryurek in view of Christensen et al. discloses the safety device of claim 21.

Eryurek further discloses wherein the control unit includes a first control device (Fig. 1 element 32right) coupled to the third transmission signal path (Fig. 1 elements: 36 from - 32left - 32right) and a second control device (Fig. 1 element 32left) coupled to the fourth transmission signal path (Fig. 1 elements: 36 from - 32right - 32left).

Regarding claim 28 Eryurek in view of Christensen et al. discloses the safety device of claim 16.

Christensen et al. further discloses wherein each of the first and second transmission lines includes a twisted pair cable or a coaxial cable (col. 5 lines 36-43).

Regarding claim 29 Eryurek in view of Christensen et al. discloses the safety device of claim 16.

Christensen et al. further discloses wherein the first transmission line is adapted to communicate electrical signals using a communication protocol based on Ethernet, Fieldbus (col.4 lines 53-64), HART, PROFIBUS, WORLDVIEW, DeviceNet, As-Interface, or CAN.

Regarding claim 30 Eryurek in view of Christensen et al. discloses the safety device of claim 16.

Eryurek further discloses wherein the control unit (Fig. 1 element 32right) includes a signal source adapted to generate an electrical signal (Fig. 5 element 70) that is communicated along the second transmission line (Fig. 1 element 36).

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Regarding claim 36 Eryurek in view of Christensen et al. discloses the method of claim 31.

Christensen et al. further discloses including comparing the measured electrical characteristic associated with the second transmission path to a normal operational value (col. 13 lines 6-19 & Fig. 4A element 210).

Regarding claim 37 Eryurek in view of Christensen et al. discloses the method of claim 36.

Christensen et al. further discloses wherein interrupting the flow of electrical signals along the first transmission path includes opening switch contacts coupled to the first transmission path in response to a change in the measured electrical characteristic associated with the second transmission path from the normal operational value (claim 19).

Allowable Subject Matter

Claims 12, 13, 14, 15, 24, 25, 26, 27, 33, & 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is (571) 272 – 5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.

Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luis E. Román
Patent Examiner
Art Unit 2836

LR/101305



PHUONG T. VU
PRIMARY EXAMINER